

**What is claimed is:**

1. A variable attenuator comprising:
  - a first attenuator for attenuating a RF signal according to a fixed voltage;
  - 5 a second attenuator connected in parallel to the first attenuator and attenuating the RF signal according to a control voltage for determining an attenuation mode; and
  - a first impedance matching unit for maintaining input/output impedance matching of the second attenuator.
- 10 2. The attenuator claim 1, further comprising:
  - a second impedance matching unit for maintaining input/output impedance matching of the first attenuator.
- 15 3. The attenuator claim 1, further comprising:
  - a first capacitor for removing serial current elements from an input RF signal and for providing the RF signal to the first attenuator; and
  - a second capacitor for removing serial current elements from an output signal of the first and second attenuators.
- 20 4. The attenuator of claim 1, wherein the first attenuator comprises a short key diode.
- 25 5. The attenuator of claim 1, wherein the fixed voltage is a power voltage divided by a certain level.

6. The attenuator of claim 1, wherein the RF signal flows to the first attenuator in a low attenuation mode.

7. The attenuator of claim 1, wherein the RF signal flows to the  
5 second attenuator in a high attenuation mode.

8. The attenuator of claim 1, wherein the RF signal flows to the first and second attenuators in an intermediate attenuation mode.

10 9. The attenuator of claim 1, wherein the second attenuator comprises a third capacitor connected in parallel to an input terminal of the first attenuator.

15 10. The attenuator of claim 9, wherein the second attenuator comprises a first short key diode for attenuating the RF signal transmitted through the third capacitor.

20 11. The attenuator of claim 10, wherein the second attenuator comprises a second short key diode connected in parallel to an output terminal of the first attenuator.

12. The attenuator of claim 11, wherein the second attenuator comprises a first and a second resistance means connected in serial between anodes of the first and second short key diodes.

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13. The attenuator of claim 12, wherein the second attenuator

comprises a control voltage input terminal is provided between the first and second resistance means.

14. A variable attenuator comprising:

- 5        a first attenuator for attenuating a RF signal according to a first voltage;
- a first impedance matching unit for maintaining impedance matching of the first attenuator in a low attenuation mode;
- a second attenuator provided between input and output terminals of the first attenuator for attenuating the RF signal according to a control voltage for
- 10      determining an attenuation mode; and
- a second impedance matching unit for maintaining input/output impedance matching of the second attenuator in a high attenuation mode.

15. The attenuator of claim 14, wherein the first and second impedance matching units have the same resistance.

16. The attenuator of claim 14, wherein the second impedance matching unit comprises at least two resistors provided between the second attenuator and a ground connection and each resistance is  $50\Omega$ .

20                  17. The attenuator of claim 14, wherein the RF signal flows to the first attenuator in a low attenuation mode and flows to the second attenuator in a high attenuation mode.

25                  18. The attenuator of claim 14, wherein the RF signal flows to the first and second attenuators in an intermediate attenuation mode.

19. The attenuator of claim 14, wherein the second attenuator comprises:

a third capacitor connected in parallel to an input terminal of the first  
5 attenuator for cutting off a control voltage to the first attenuator;

a first short key diode for attenuating the RF signal transmitted through the  
third capacitor;

a second short key diode connected in parallel to an output terminal of the  
first attenuator; and

10 first and second resistance means corrected to anodes of the first and  
second short key diodes for applying the control voltage.

20. A variable attenuator comprising:

a first short key diode for attenuating a RF signal according to a first  
15 voltage;

a second short key diode, connected in parallel to an anode of the first  
short key diode for attenuating the RF signal, according to a control voltage;

a third short key diode connected in parallel to a cathode of the first short  
key diode for attenuating the RF signal, according to the control voltage;

20 a first resistor provided between a cathode of the short key diode and a  
ground connection; and

a second resistor provided between a cathode of the third short key diode  
and the ground connection.

25 21. The attenuator of claim 20, further comprising:

a capacitor connected to the anode of the first short key diode for cutting

off a control voltage provided to the first short key diode.

22. The attenuator of claim 20, further comprising:  
third and fourth resistors for applying the control voltage to the anodes of  
5 the second and third short key diodes, respectively.

23. The attenuator of claim 20, wherein the first and second resistors  
are approximately  $50\Omega$ .

10 24. The attenuator of claim 20, wherein the RF signal flows to the first  
short key diode, in a low attenuation mode.

25. The attenuator of claim 20, wherein the RF signal flows to the  
second and third short key diodes in a high attenuation mode.

15 26. The attenuator of claim 20, wherein the RF signal flows to the first,  
second, and third short key diodes, in an intermediate attenuation mode.

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